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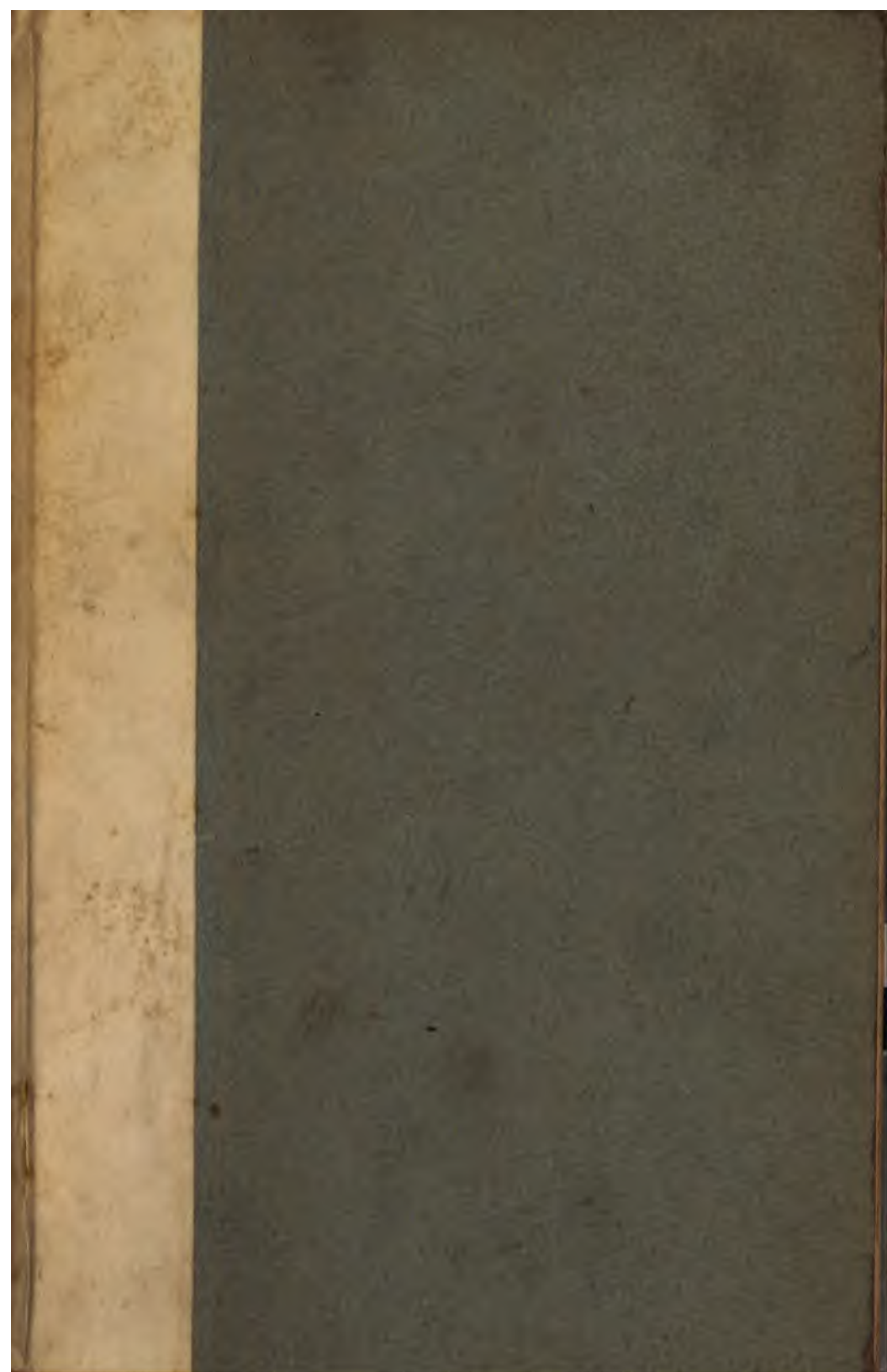
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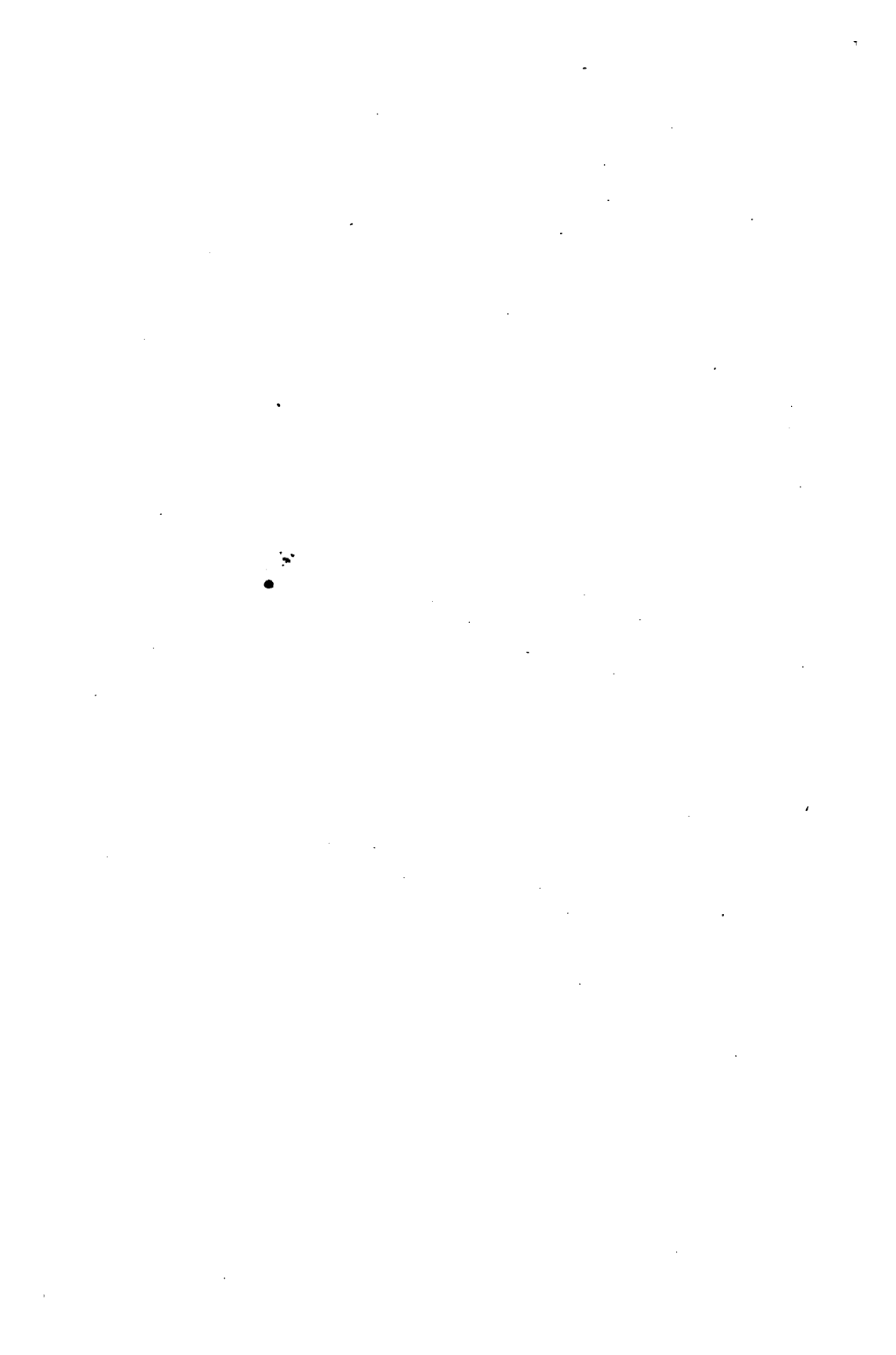
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178.  
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PART I.

PRICE 2s. 6d.

A  
HISTORY  
OF  
BRITISH REPTILES.

BY  
THOMAS BELL, F.R.S. F.L.S.

PROFESSOR OF ZOOLOGY IN KING'S COLLEGE, LONDON.

ILLUSTRATED BY A WOODCUT OF EACH SPECIES, WITH SOME  
OF THE VARIETIES, AND NUMEROUS VIGNETTES.



LONDON:  
JOHN VAN VOORST, 1, PATERNOSTER ROW;  
BOOKSELLER TO THE ZOOLOGICAL SOCIETY.

15 February, 1838.

S. BENTLEY,

DORSET STREET.

178. 6. 252.

IN PREPARATION,  
To appear as soon as possible after the completion of the Reptiles,  
**A HISTORY OF BRITISH CRUSTACEA,**  
BY THE SAME AUTHOR.

The Drawings for this work will be by J. O. Westwood, F.L.S.  
Secretary to the Entomological Society.

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**A HISTORY OF THE FOSSIL FRUITS AND SEEDS  
OF THE LONDON CLAY.**

BY JAMES SCOTT BOWERBANK, F.G.S.

This subject has been the peculiar study of Mr. Bowerbank for many years, during which time more than 120,000 specimens have passed through his hands. The work will be illustrated by as many specimens as can with certainty be determined, drawn and engraved by Mr. James de Carl Sowerby.

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IN THE PRESS.  
**A GEOGRAPHICAL AND COMPARATIVE LIST  
OF THE  
BIRDS OF EUROPE AND NORTH AMERICA.**  
BY CHARLES LUCIEN BONAPARTE, PRINCE OF MUSIGNANO.

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JOHN VAN VOORST, 1, PATERNOSTER ROW.

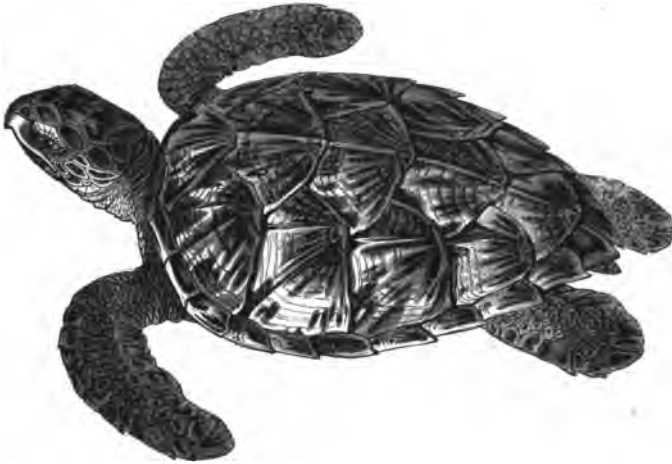
*See Wrapper, page 3 & 4.*

4

# BRITISH REPTILES.

TESTUDINATA.

CHELONIADÆ.



Genus, *Chelonia*. Brongn.

*Generic Character.*—Dorsum large, depressed, somewhat heart-shaped, covered with horny plates; feet depressed, fin-shaped.

## HAWK'S-BILL TURTLE.

*Chelonia imbricata*. Schweig.

*Specific Character.*—Dorsal plates thirteen, free at the margins, imbricated.

*Testudo imbricata*, LINN. Syst. Nat. p. 350, sp. 2. SCHNEID. Schildkr. p. 509.

PENN. Faun. Ind. p. 87. LATR. Hist. Rept. I. p. 50.

DAUD. Hist. Rept. II. p. 39.

*Chelonia imbricata*, SCHWEIG. Prod. in Archiv. Koenigsb. I. p. 291, et 408.

GRAY, Syn. Rept. p. 52, sp. 1. BIBRON, Hist. Rept.

II. p. 548, t. xxv. f. 2. BONAP. (Pr. Musign.) Syn. Chelon.

*Hawksbill Turtle*, BROWN, Jamaic. p. 463. CATESB. Nat. Hist. Carol. II. p. 39, t. lix.



THE single and purely accidental occurrence of a bird or of a fish within the range of our guns or our nets, has always been deemed sufficient warrant to constitute the wanderer fair game to our native Faunists. It may, perhaps, be doubted whether the important and interesting subject of the geographical distribution of animals can receive much illustration from thus swelling the catalogue of local species by the addition of such as owe their place in our Fauna rather to the caprice of the winds or the waves, to the violence of a storm, or the temptation of an unusual chase after their food, than to any regular and voluntary migration: nor does there appear any very sufficient reason for distinguishing between those species of birds, for example, which are driven over to our coasts by the immediate force of the tempest, and those which are brought from the same countries, and wafted hither by the same impelling power, but through the medium of the sails of a ship, and secured by the safeguard of a cage. However, as such is now the established custom of naturalists, I have determined on availing myself of the means thus offered me, of adding to the interest of this little work, by admitting, as all previous British Faunists have done, the two species of stray Turtles which have accidentally been found on our coasts, although certainly neither the one nor the other can claim to be considered as indigenous.

The family of CHELONIADÆ, to which both the species which have thus obtruded themselves into our Fauna belong, is composed exclusively of marine Turtles. The most generally interesting species are the common esculent Turtle, *Chelonia Mydas*, well known as a delicious article of food, and the present species, which furnishes the beautiful substance known by the name of Tortoise-shell.

The structure of the whole family is admirably adapted to their marine habits. The body is flattened so as greatly to facilitate their progress through the water; the feet are

formed into the most perfect oars, by means of which they are propelled with considerable force and velocity; "the Green and Hawk-billed in particular," says Audubon, "remind you, by their celerity, and the ease of their motions, of the progress of a bird in the air." The head is so placed upon the neck as to allow of the nostrils being readily raised above the surface for the purpose of occasional respiration. The nostrils, also, are furnished with a fleshy valve, which is closed when the animal is submerged, but opens when required for respiration. The food of the Green Turtle consists of marine plants, especially the sea wrack, *Zostera marina*; and they graze at the bottom of the water, coming at intervals to the surface to breathe. As this mode of taking their food renders them very liable to swallow, with their aliment, a considerable quantity of sea-water, there is a beautiful structure lining the interior of the cesophagus, by which this circumstance is effectually obviated. This consists of a great number of horny pyramidal bodies, with which the whole interior of the cesophagus is furnished, all of them directed backwards towards the stomach; by which means, although the food and the water together can be readily swallowed, yet, when the stomach is contracted for the purpose of regurgitating the water, the food itself is retained. "The Hawk-billed species feeds on sea-weeds, crabs, various kinds of shell-fish, and fishes; the Loggerhead mostly on the fish of conch shells of large size, which they are enabled, by means of their powerful beak, to crush to pieces with apparently as much ease as a man cracks a walnut. The Trunk Turtle feeds on mollusca, fish, crustacea, sea-urchins, and various marine plants."\*

Their jaws are strong, and firmly articulated. The horny beak, which so much resembles that of some birds as to have led to the application of the name of Hawk's-billed

\* Audub. Amer. Ornith. Biog. II. p. 374.

Turtle to the species about to be described, is very hard, but the edge is sharp, in most cases toothed, and that of the lower jaw is received into a groove of the upper; so that the food taken between them is not only cut by the external sharp edges passing each other, but bruised by the pressure of the lower mandible against this upper groove and its internal margin. When not engaged in feeding, they are often seen floating without the slightest movement on the surface of the sea, sometimes at considerable distance from the land, apparently asleep; for they are at such times easily approached and taken.

The annual resort of the various species of marine Turtles to the land for the purpose of depositing their eggs, is one of the most interesting points of their history. On the Island of Ascension, on the shores of the Gulf of Florida, and in many other places, innumerable multitudes of Turtles arrive at a period of the year differing somewhat in the different species, but in all during the early part of the summer. They resort to their favourite breeding-places from various parts, some even from a great distance; and there is reason to believe that each individual returns year after year to the same place. The following details of this operation, from the graphic pen of my friend Audubon, are so interesting that I offer no apology for inserting them without mutilation.

“On first nearing the shore, and mostly on fine calm moonlight nights, the Turtle raises her head above the water, being still distant thirty or forty yards from the beach, looks around her, and attentively examines the objects on shore. Should she observe nothing likely to disturb her intended operations, she emits a loud hissing sound, by which such of her many enemies as are unaccustomed to it are startled, and so are apt to remove to another place, although unseen by her. Should she hear any noise, or perceive any indications of danger, she instantly sinks, and goes off to a considerable

distance ; but should everything be quiet, she advances slowly towards the beach, crawls over it, her head raised to the full stretch of her neck, and when she has reached a place fitted for her purpose, she gazes all around in silence. Finding 'all well,' she proceeds to form a hole in the sand, which she effects by removing it from *under* her body with her *hind* flappers, scooping it out with so much dexterity that the sides seldom if ever fall in. The sand is raised alternately with each flapper, as with a large ladle, until it has accumulated behind her, when, supporting herself with her head and fore part on the ground fronting her body, she, with a spring from each flapper, sends the sand around her, scattering it to the distance of several feet. In this manner the hole is dug to the depth of eighteen inches, or sometimes more than two feet. This labour I have seen performed in the short period of nine minutes. The eggs are then dropped one by one, and disposed in regular layers, to the number of a hundred and fifty, or sometimes nearly two hundred. The whole time spent in this part of the operation may be about twenty minutes. She now scrapes the loose sand back over the eggs, and so levels and smooths the surface, that few persons on seeing the spot could imagine anything had been done to it. This accomplished to her mind, she retreats to the water with all possible dispatch, leaving the hatching of the eggs to the heat of the sand. When a Turtle, a Loggerhead for example, is in the act of dropping her eggs, she will not move although one should go up to her, or even seat himself on her back ; for it seems at this moment she finds it necessary to proceed at all events, and is unable to intermit her labour. The moment it is finished, however, off she starts ; nor would it then be possible for one, unless he were as strong as a Hercules, to turn her over and secure her."\*

\* Audub. Amer. Ornith. Biog. II.

Each Turtle has generally three layings in the season, at intervals of two or three weeks. The eggs are perfectly round, varying from two to three inches in diameter. The external membrane is flexible, very white, and contains a considerable quantity of calcareous matter. The yolk forms in general an exceedingly delicate article of food ; but that of the Loggerhead Turtle has a somewhat musky flavour.

When the young ones are hatched, which takes place from a fortnight to three weeks after the eggs are deposited, according to the temperature, they have only that central part of each scale or plate formed which is termed the *areola* ; and all the concentric layers which in advanced age are seen to constitute the principal part of the plates are added afterwards at their margins. The shell is soft, and affords them but little protection from the attacks of their numerous enemies. In their attempts to gain the water for the first time, numbers of them fall a prey to birds of various kinds ; and of those which are fortunate enough to escape from this danger, probably the greater part are seized and devoured by shoals of fish and of crocodiles.

The different species of marine Turtles are found in all the seas of hot climates, and they are only seen in considerable numbers within a certain distance from the land. About the shores of several of the West India Islands, “ Cuba, Jamaica, St. Domingo ; in the Atlantic, at the Cape de Verde and Ascension Islands ; again, in the Indian Ocean, at the Isle of France, Madagascar, the Seychelles, &c. ; at Vera Cruz, in the Gulf of Mexico, and at the Sandwich and Gallapagos Islands, in the Pacific,”\* they are found in the greatest abundance.

It is unnecessary, and it would be out of place here, to enter at large upon the particular history of the different species. Every one knows the value of the Green Turtle,

\* Dumeril et Bibron, Hist. des Rept. II. p. 520.

as it is commonly called, as an article of luxurious and most nutritious food; and all the species afford a large quantity of oil, which is employed for various purposes. But it may not be uninteresting to offer a few observations on the particular utility of the species which is now to be described.

The Hawk's-billed Turtle, *Chelonia imbricata*, is not generally used in food, as its flesh is far from being either so wholesome or agreeable as that of the Green Turtle; but the large scales with which it is covered are so much employed in the arts, both for purposes of ornament and utility, as to constitute no unimportant object of merchandize. It is the substance commonly called Tortoise-shell. For the following short account of the mode of obtaining and preparing it, I am principally indebted to the admirable History of Reptiles by my excellent friends M. Dumeril and M. Bibron.\*

Although the greater number of the whole order of Testudinata have the back and sternum covered with horny plates, or scales, it is almost exclusively those of the present species which are applicable to the purposes just named. The thirteen plates with which the whole upper part of the shell is covered, are in fact much thicker and stronger, as well as more beautifully clouded in colour, than those of any other species; and as they lie one over the other like the tiles of a house, so that at least one-third of each overlaps the one behind it, they are much larger in comparison with the size of the individual. The scales, or plates, are in the first place separated by the application of heat. They are sold to the manufacturers in the rough state, in which they are uneven, fragile, opaque, and dirty; and it is the first object of the artificer to obviate these defects. The uneven surface, the irregular curvature, the unequal thickness of different parts, have all to be corrected; and not only can these ob-

\* Hist. des Rept. II. p. 524, et seq.

jects be readily effected, but the substance can be rendered ductile, compressible, capable of receiving any impression, of being carved, moulded and polished, and even extended by soldering pieces together by means of their own substance reduced to powder. The whole of these processes are performed by means of heat.

The uneven curvature is first of all to be removed, and the plate rendered perfectly flat. This is effected by immersing it in hot water, and then allowing it to cool under heavy pressure between smooth blocks of wood, or metallic plates. The surface is then rendered smooth, and the thickness equal, by scraping and filing away the rough and prominent parts. In this way each plate receives an equal and smooth surface. But it is in many cases desirable to employ larger pieces than can be obtained from single plates, and two pieces are then united together in the following manner:—The edges are bevelled off to the space of two or three lines, and the margins when placed together overlap each other to that extent. They are then pressed together by a metallic press, and the whole is submitted to the action of boiling water; and by this means the two pieces are so perfectly soldered together, as to leave no indication of the line of union. By the application of heat, also, the tortoise-shell may be made to receive any impression by being pressed between metallic moulds.

No portion of this precious substance is lost or useless. The filings and powder, which remain after these and the other processes to which the shell is submitted, are placed with any small fragments in metallic moulds, and by means of pressure, exercised whilst they are exposed to the heat of boiling water, they are formed into plates of any thickness which may be required.

Such is a very hasty and general sketch of the manner in which this beautiful substance is rendered available to the

many purposes of ornament and use in which it is constantly employed.

The history of this species as a British visitant is confined to the mere notice of its accidental occurrence on three different occasions on the shores of Great Britain. Sibbald states that he received the shell of one which "came into Orkney;" Dr. Fleming says, "I have credible testimony of its having been taken at Papa Stour, one of the West Zetland Islands;" and the late Dr. Turton has mentioned an instance of one which "in the year 1774 was taken in the Severn, and placed in the fish-ponds of the author's father, where it lived till winter."

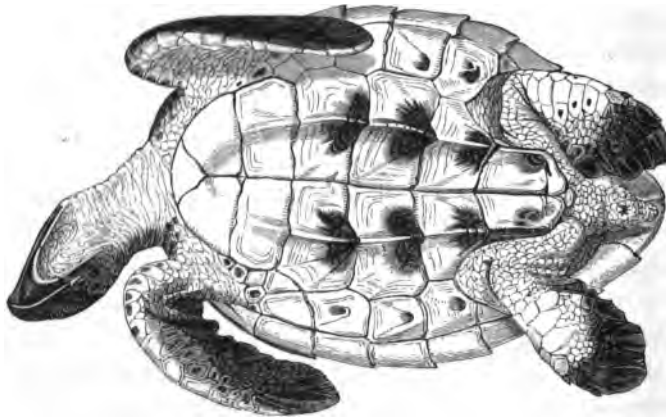
It is found about the islands and coasts both of the Indian and Atlantic Oceans, where it occurs in considerable abundance, its flesh is said to be unpalatable, but the eggs are considered a great delicacy. It does not generally attain to more than one-third the size of the Green Turtle.

The shell of this species is depressed, rather longer in proportion to its breadth than the other species, and somewhat heart-shaped. It is covered with thirteen imbricated plates, each of which in the young state has the apex pointed; but in older individuals this is entirely worn away. The margin has plates, which are prominent at the posterior and exterior angle, especially those towards the hinder part, so as to form sharp and strong denticulations. The under side, or sternum, has twelve plates; and there are two carinæ which run through its whole length from the anterior to the posterior margin; these ridges, however, are worn off by age; but they were very evident in the individual from which the present figures were taken, and which I had alive for a short time in my possession. The head is rather elongated, flattened above, and compressed at the sides in front of the eyes, so that the beak is less arched than in any other species of the genus. The head is covered with fourteen scales, to



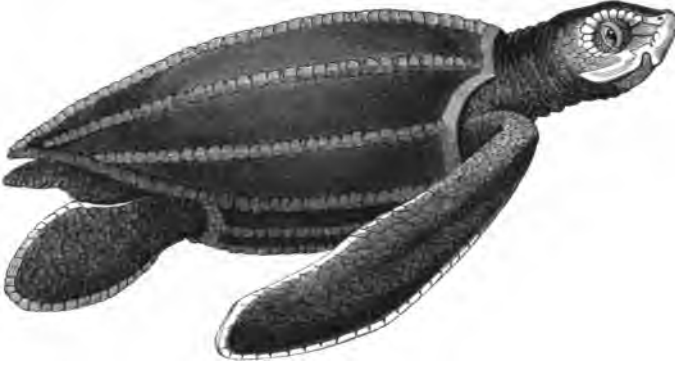
which, in zoological language, different names are given from their situation. The upper and lower jaws are covered with a horny beak, as before described; they are not denticulated at the edges; they are sharp, and scarcely sinuous; and the apex, both in the upper and lower, is sharp and hooked, that of the under shutting within that of the upper. The feet do not materially differ from those of the species generally, of the marine form, as before described. The tail is conical, and is so short that it does not extend beyond the posterior margin of the shell.

The colour of the upper parts is yellow, marbled or splashed with a deep rich brown; the plates of the head are brown, often margined with yellow; the under parts of the whole animal are yellowish white; and in the young individual there is a spot of black occupying the areola, or nuclear spot of the four posterior pairs of sternal plates.



TESTUDINATA.

CHELONIADÆ.

Genus, *Sphargis*. Merr.

*Generic Character*.—Body wholly without scales; covered with a leathery skin. Feet without nails.

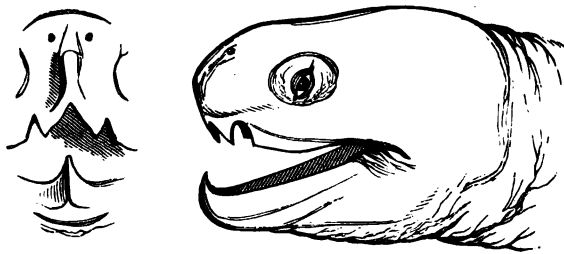
## LEATHERY TURTLE.

TRUNK TURTLE.

*Sphargis coriacea*.

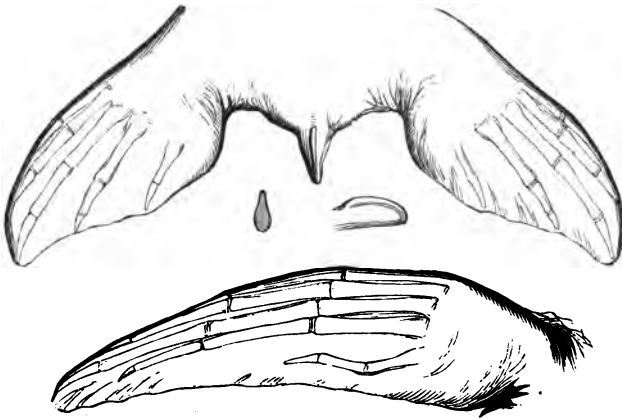
- Testudo Mercurii*, GESN. Aquat. II. p. 1134.  
 „ *coriacea*, LINN. Syst. Nat. I. p. 350, sp. 1. SCHNEID. Schildk.  
 p. 512. DAUD. Hist. Rept. II. p. 62, t. xviii. f. 1.  
 TURT. Brit. Faun. p. 78.
- Sphargis* „ GRAY, Syn. Rept. p. 51. DUMER. et BIBRON, Hist.  
 Rept. II. p. 560, t. xxiv. f. 2. BONAP. Faun. Ital.  
 JENYNS, Brit. Vert. p. 290.
- „ *Mercurialis*, MERR. Amph. p. 19. RISSO, Hist. Nat. Eur. Merid. III.  
 p. 85. SCHLEG. Faun. Japon. Chelon. p. 6, t. 1, 2, 3.
- Corindo coriacea*, FLEM. Brit. Anim. p. 149.
- Coriaceous Tortoise*, PENNANT, Brit. Zool. III. p. 7, t. i.
- Turtle*, BORLASE, Nat. Hist. of Cornw. p. 285, t. xxvii. f. 4.
- Dermatochelys porcata*, WAOL. Syst. Amph. p. 133. t. i. f. 1—23.

THIS remarkable species is distinguished from all the other marine species, by the absence of horny plates upon the body, head, and limbs; which, instead of them, are covered by a tough leathery skin. In this respect it bears the same relation to the family to which it belongs, that the different species of *Trionyx* do to the fresh-water Tortoises most nearly allied to them. This skin is perfectly smooth in the adult; but in young specimens it is covered with hard tubercles. The head is more acute than in the other species of marine Turtles: it is somewhat triangular when viewed from above, the part anterior to the eyes being narrowed; the jaws are of immense strength, and the edges very sharp; the upper one has three remarkable notches, one in the centre, which is angular, and one on each side at a short distance from the former, which are rounded. The lower jaw is scarcely sinuated at the margin, and the point is very acute, and somewhat hooked, corresponding with the central notch of the upper. The nostrils are small, and perfectly circular. The eyes rather large, opening nearly vertically, particularly in the younger specimens. The view of the head here given



is from a very large individual, of which the head and extremities are in my collection. The carapax, or dorsal shell, has seven distinct raised carinæ, or ridges, which in the adult are sharp, and slightly toothed: in the young they are rounded, and composed of a number of round obtuse tuber-

cles. These seven ridges are equidistant, and consist of one along the median line of the back, one on each margin of the shell, and two on each side between the dorsal and the marginal one. The anterior paddles are remarkably long, being more than twice the length of the hinder ones, and somewhat falcate; the latter, however, are generally broader than the former. They are covered with a perfectly smooth skin. The tail is acute, much compressed at the sides, and extends only to the extreme point of the dorsal shell. The following figures of these parts are from the specimen above mentioned.



The young individual differs from the adult more considerably in this species than in any other species of the order with which I am acquainted. Some of the peculiarities of the former age have already been alluded to; in addition to which may be mentioned the more full and rounded form, the larger head, the larger and more expanded eye, and the existence of five ridges on the sternum. The eye opens almost vertically, which gives a peculiar and strange aspect to the young animal. The figures at the head of this descrip-

tion are from the plate in the Prince of Musignano's "*Fauna Italica*;" and were taken from a very young individual.

The colour of the adult is generally a full brown, with numerous pale yellowish spots; in the very fine specimen in my collection, the under side of the extremities and throat are white, with black irregular spots, rendering them, in fact, pied.

This species, which is stated by Mr. Audubon to resort to the Tortugas, or Turtle Islands of Florida, is later than the other species in arriving thither for the purpose of depositing its eggs. The average number laid by it, according to the same authority, may be three hundred and fifty in two sets. It is less cautious than the other species in choosing the places for this important operation. "Its food consists of mollusca, fish, crustacea, sea-urchins, and various marine plants."

"The lyre," says Sir John Hawkins, "is the prototype of the fidicinal or stringed species" of instruments, "and is said to have been invented about the year of the world 2000 by Mercury, who, finding on the bank of the river Nile a shell-fish of the Tortoise kind, which an inundation of the river had left there, and observing that the flesh was already consumed, he took up the back-shell, and, hollowing it, applied strings to it."\* This application of the dorsal shell of a Tortoise to the construction of a musical instrument by Mercury is of very general reception amongst the classical writers, and is even mentioned by Homer in his Hymn to Mercury. To what species of Tortoise the individual belonged, which was destined to be the means of so much enjoyment to mankind in all subsequent ages of the world, it would be useless now to enquire: but it is not improbable that the seven ridges on the back of the present species may have given rise to the belief that it may have been the favoured animal; particularly as seven strings are by some of the ancient writ-

\* *Harmonia Manualis*, II. p. 29.

ers assigned to the lyre; for Amphion is said to have "built the seven gates of Thebes in compliment to the seven strings of his lyre." This legend is neither overstrained, nor improbable; for the margin of the shell would afford a very good fastening for the strings, and the arched vault of the back would answer the purpose of a good reverberating cavity.

This species is found in the Mediterranean, in the Atlantic, the Pacific, and the Indian Oceans. My own specimen, above referred to, was from the latter locality.

The history of its occurrence on the shores of Great Britain is as follows:—Borlase, in his History of Cornwall, mentions "two of a vast size which were caught in the mackerel nets off the coast of Cornwall, a little after Midsummer 1756. The larger weighed eight hundred pounds, the lesser nearly seven hundred." Pennant states that "a third, of equal weight with the first, was caught on the coast of Dorsetshire, and deposited in the Leverian Museum." This specimen, if I mistake not, is the one now in the British Museum. "The late Bishop of Carlisle informs me," proceeds Pennant, "that a Tortoise was taken off the coast of Scarborough in 1748 or 1749. It was purchased by a family then resident there, and several persons were invited to partake of it. A gentleman, who was one of the guests, told them it was a Mediterranean Turtle, and not wholesome; only one of the company ate of it, who suffered severely, being seized with dreadful vomiting and purging."

The following are the dimensions of the parts in my possession of the large specimen to which I have before referred, the total length of which was eight feet.

	Ft.	In.	Lines.
Length of the head . . . .	0	11	4
Greatest breadth of the head . . . .	0	9	6
Breadth between the orbits . . . .	0	3	4
Length of the fore-paddles . . . .	2	10	0
Greatest breadth of the fore-paddles . . . .	0	9	6

	Ft.	In.	Lines.
Length of the hinder-paddles . . . . .	1	2	0
Breadth of the hinder-paddles . . . . .	0	8	8
Length of tail . . . . .	0	3	9

Supposing the neck to have been eight inches, the upper shell would have been nearly six feet and a half in length.

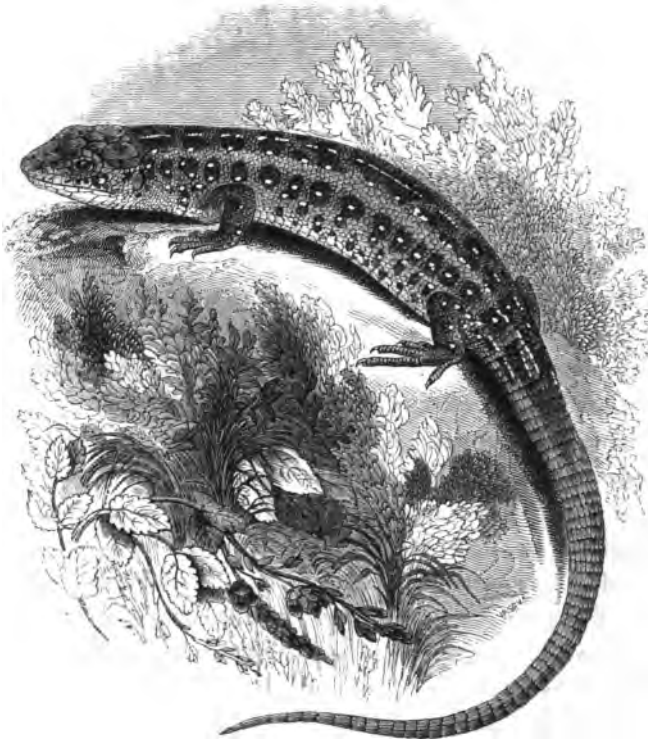
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Although such is the meagre total of our claim to indigenous species of the Testudinata, there appears to be no obvious reason why many of the land and fresh-water species should not be naturalized, or at least bred in a domesticated state, in our southern counties. Every one knows that the *Testudo Græca*, or common land Tortoise, will live for a great number of years in this country without any particular care; nor do I doubt that the common fresh-water species of Europe, *Terrapene Europæa*, might be readily introduced here, as well as several species of *Emys* from the United States. They would probably require some little attention for the first few winters; but I doubt not they may in a short time be completely acclimated.



SQUAMATA.  
(SAURIA.)

LACERTIDÆ.



Genus, *Lacerta*. Linn.

*Generic Character*.—Throat with a distinct collar. Nostrils situated towards the outer and inferior margin of the nasal scuta. An osseous superorbital lamina. Temples covered with scuta. Scales of the back, orbiculo-polygonal, slightly carinated. Palate toothed.

SAND LIZARD.

*Lacerta agilis*. Linn.

? *Lacertus terrestris anguiformis*, MERRETT, Pinax, p. 161. RAY, Syn. Quad.  
p. 264.



- Lacerta agilis*, LINN. FR. Sæc. 284.—IN. curâ RATT. 289.—Syst. Nat. I. 363, n. 15. MULL. Zool. Dan. Prod. p. 36, n. 299. MERR. Syst. Amph. p. 66, sp. 13. C. L. BONAP. FAUN. Ital. cum Icon.
- „ *stirpium*, DAUD. Rept. III. p. 155, t. xxiv. f. 2. DUGÉS in An. des Sc. Nat. XVI. p. 376, sp. 3, t. lxxvi. f. l. 2. JENYNS, Brit. Vert. p. 291.
- „ *arenicola*, DAUD. l. c. p. 230, t. xxviii. f. 2.
- „ *anguiformis*, SHEPPARD, in Linn. Trans. XVI. p. 51.
- Lézard des Souches*, DAUD. l. c. M. EDW. in An. des Sc. Nat. XVI. p. 65. 83. t. v. f. 4, et t. viii. f. l. 2.
- Lacerta di Linneo*, C. L. BONAP. l. c.

BECAUSE it may appear to many persons not accustomed to the use of what are commonly termed essential generic or specific characters, that many of those phrases by which such characters are expressed are confined in their signification, and the characters themselves of slight value and importance, it may not, perhaps, be useless, before we proceed to describe the species, to offer a few words explanatory of their employment, especially with reference to those groups of animals on which the present work professes to treat. It has always appeared to me that generic distinctions should, as far as possible, be limited to such differences of structure as indicate a difference in the habits of the animals. Thus, the absence in one species, and the presence in another, of an organ or part of an organ, the application of which is of obvious or probable moment in any of the habits of life,—as, for example, the degree of developement of the thumb in some genera of monkeys, or the modification of the carnivorous propensity in allied groups of *carnivora*, evidenced by the greater or less degree of acuteness in the tubercles of certain teeth,—will form good grounds for such a distinction. Now it is evident here that what is called the generic character is merely the phrase expressive of some point of structure belonging to the whole group in which a certain habit obtains. In many cases even, the most convenient, or the only tangible characters of the group may have

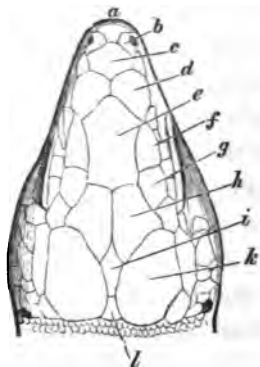
no reference whatever to the peculiarity of habit which forms the legitimate foundation for the generic distinction. This will be found to be the case, for instance, in some of the genera of saurian reptiles, and even in the generic distinction of our only two native species ; the genus *Zootoca*, to which our common Lizard belongs, being *characterized*, as regards habit, by the circumstance that the species of which it is composed are ovo-viviparous. This is a character to which the structure of any of its external organs bears no possible relation ; but as it is found that the species having this habit is externally characterized by some peculiarity in the form and situation of certain little scales about the head, having, however, no possible reference to the habit in question, such peculiarities are employed as convenient and permanent characters by which it may be distinguished.

It must, however, be acknowledged that there are cases in which a numerous group is found to consist of several divisions, each of them distinguished by some point of form or structure, the use or object of which is absolutely unknown or unintelligible to us, and in which the habits, as far as we know them, are not conspicuously different. For the sake of convenience in some cases, and of consistency and harmony of system in others, these groups may, notwithstanding this uncertainty, receive with propriety a distinctive generic appellation ; but, wherever it is possible, generic groups ought only to be formed where Nature has herself pointed out their distinction.

The generic and specific characters of the *Lacertine* group have only of late years received the degree of attention which they deserved. The divisions and subdivisions of this numerous family had been either overlooked, or so arbitrarily defined as to be detected with difficulty, and their value had been greatly misunderstood. The employment of minute characters in the structure and proportions of the differ-

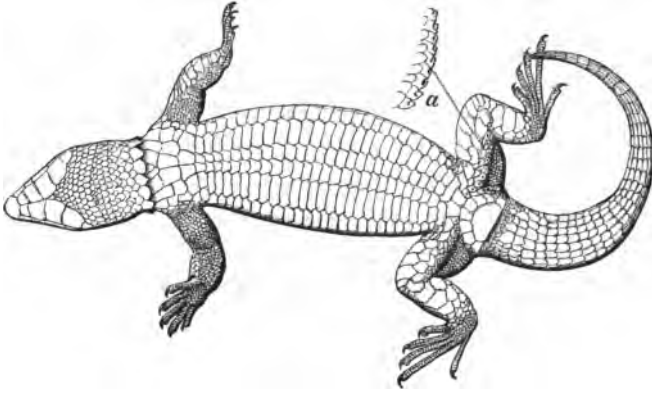
ent parts of the body, the relative dimensions of the limbs, and the form and size of certain important scales, has, however, of late produced a greater degree of certainty, and more accurate definition, not only in the relation of the groups, but also in the characters of the species. One of the most useful attempts to reduce the characters of the Lizards to a tangible and certain rule, dependent upon differences which, though apparently trifling in themselves, are of great value as being constant and easily detected, was made by my friend Dr. Milne Edwards, in a valuable paper in the sixteenth volume of the "*Annales des Sciences Naturelles*;" and Wagler has since that carried the principles of generic subdivision to an extent perhaps scarcely warranted by nature. Upon this point, however, it would be out of place here to dwell.

The external parts from which the artificial characters of the present group of reptiles are founded, are principally the plates covering the head, the scales of the collar, the præ-anal scale, those in which the femoral pores are placed, the abdominal plates, and the scales of the back and tail. In order to comprehend these characters, I here introduce an outline of most of these parts. In the first figure, the plates of the upper part of the head of the species about to be described are exhibited, and they are thus designated:—a, rostral; b, nasal; c, internasal; d, fronto-nasal; e, frontal; f, anterior palpebral; g, posterior palpebral; h, fronto-parietal; i, inter-parietal; k, parietal; l, occipital.



In the next figure, the under parts of a variety of the same species are exhibited in outline, to show the collar, the

abdominal plates, the præ-anal plate, those which are perforated by the femoral pores, and the scales of the tail.



In the whole of the sub-family of *Lacertina* the head is covered by the number of plates designated above, differing only in some very trifling modifications of form. The abdomen is covered by broad plates, as seen in the figure, not imbricated, or lying one over another, as are the scales of the back and tail, but applied to each other at the margins; and these are arranged in longitudinal rows. There is in all the species a distinct collar, composed of several scales, larger than those which cover the throat, and quite detached from the plates which cover the breast, which they loosely overlay. The scales of the back and sides are small, and imbricated. Those of the tail are always arranged in distinct and even whorls, are elongated and narrow, becoming more so towards the termination of the tail. The femoral pores, as they are termed, exist also in all the family. They consist, probably, of very small follicular glands, each placed in a scale, the middle of which is pierced by the opening of the follicle. In some the scale is very little larger than the pore, and appears almost like a minute tube; in others the scale is

larger and triangular. The use of these pores is not known. They vary exceedingly in number, even in the same species : in this respect, therefore, they afford no distinctive characters.

In some species, in addition to the teeth which are placed in the margins of the upper and lower jaws, there are also a few very minute ones in the back part of the palate, which may be readily felt by a pin or the point of a penknife. The existence or absence of these palatine teeth would, perhaps, scarcely be admissible alone as a generic distinction ; but when combined with others, and associated also with a marked difference of habit, it may be admitted as a valuable, because a tangible and permanent character. It is on this account that I have employed it as one of the means of generic discrimination between our two English Lizards.

I now proceed to the consideration of our first species.

It has been well remarked by the Prince of Musignano, whose knowledge of the European Vertebrata in general, and of the Reptilia in particular, is undoubtedly superior to that of any other naturalist, that the Linnean term *agilis* has been applied by the Zoologists of different countries to that species of Lizard which is best known or most common in their own. Thus the *Podarcis muralis*, the common Lizard of Italy and of France, has been so called by Italian and French writers ; and our own little indigenous species, so frequent in almost all parts of England, which I shall presently describe under its proper appellation of *Zootoca vivipara*, has hitherto received the same name from every British naturalist who has written on the subject. Not even when the present handsome species was distinguished as indigenous to this country, was it suspected that the name applied to the former was erroneous as so applied, and still less that it might, in fact, appertain to this new addition to our Fauna.

The slender knowledge possessed by Linneus of the species of Reptilia, and his total ignorance of the value of specific characters in this class, led him to include amongst the supposed varieties of his *Lacerta agilis* several which have since been ascertained to be not specifically only, but generically distinct ;—at least, according to the rigid principles of subdivision adopted by several of our more distinguished modern Erpetologists. As, however, the typical form of his species thus named was indigenous to Sweden,—for he refers in his great standard work, the “*Systema Naturæ*,” to the “*Fauna Suecica*” to fix its identity,—it only remains for us to ascertain what is the common species of that country, to fix this doubtful and obscure synonymy.

It appears quite clear that neither of the two species which I have before mentioned as having erroneously received the name of *Lacerta agilis* can possibly be the one originally intended by the great Swedish naturalist, as neither of them appears to be indigenous to that country. But it is not only highly probable, but becomes a demonstrated fact, that the present species is the type of the *L. agilis* of Linneus, when it is considered that it is a native of Sweden, and that the short allusion—for it is nothing more—in the “*Fauna Suecica*” is perfectly applicable to it. The specific character given by Linneus both in the “*Fauna Suecica*” and the “*Systema Naturæ*” is vague, and equally applicable to the whole of the genus *Lacerta* as now constituted ; but he proceeds to name two varieties in the following manner :—“*β Lacertus viridis* Aldrovand. *γ. Lacertus dorso punctis albis duplici serie.* Var. *β rarissima, nec mihi ipsi obvia.*” Here we have the common and the rarer green varieties of our own species indicated, at least, with great probability. But in the more recent edition of the same work by Retzius, the characters are still more decidedly applicable ; and the expression “*laterum ocellis nigris, pupillâ alba,*” is decisive.

This opinion is also corroborated by the short description given by Otho Frederick Müller, in his "Prodromus Zoologiæ Danicæ," of two varieties of the indigenous *Lacerta* of Denmark, which he also terms *L. agilis*. The following are his words:—"b. suprà maculis nigris punctis linearibus [albis\*] inscriptis, subtus absque maculis. c. Suprà cinereo-fusca, punctis albis nigrisque contignis." These are very accurate descriptions of the markings of different individuals of the present species; even the green variety, which occurs also in this country, was not unknown to Müller, who adds, "viridem quoque in sylva Frederichsdalensi reperi."

From these considerations it becomes necessary to reform the nomenclature and synonymy of our English Lizards, by restoring the name of *agilis* to the present species, to which it originally belonged,—by abolishing altogether that of *stirpium*, adopted by Mr. Jenyns from the French writers, by whom it had been applied to this species,—and in the case of the other and more common indigenous species, by substituting for the name *L. agilis*, hitherto applied, that of *Zootoca vivipara*, which really belongs to it. The first naturalist who has demonstrated that the species now under consideration is the true Linnean *agilis*, is the Prince of Musignano, who, in his beautiful "Fauna Italica," has thus restored its true name, with the additional Italian appellation of *Lacerta di Linneo*. I have lately examined many specimens of both species in company with that distinguished naturalist, and have thus had the views now stated amply confirmed.

As a British species, there appear to be on record several more or less obscure allusions to it amongst former writers. Merrett, in his "Pinax," mentions the common or viviparous species as "*L. terrestris vulg. ventre nigro maculato*;"

\* The word here is originally "*nigris*;" but this is evidently a misprint. Spots of black could not be said to be marked with *black* dots.

and the present one is probably intended by the phrase "*L. terrestris anguiformis, in ericetis.*" These words, with the enumeration of the different species of Newts, are copied verbatim by Ray without acknowledgment. This, however, is but an obscure and uncertain allusion. The first description of the species by any British Zoologist is that by the Rev. Revett Sheppard, in the sixteenth volume of the Linnean Transactions, in the year 1802. This gentleman adopts the specific name *anguiformis* from Ray, with whom he appears to believe it to have been original, as he was probably unacquainted with the "Pinax" of Merrett. The Lizard to which his description refers could not have been a variety of the common species, as the latter never acquires half the length of one specimen seen by Mr. Sheppard, which, he says, was upwards of a foot long; and this, although certainly an extraordinary, is not an incredible length for an individual of this species, as I have myself occasionally seen them approaching that length, measured from the nose to the extremity of the tail. Even the general length of Mr. Sheppard's specimens was "seven inches and upwards." It is true that the characters and descriptions given by this author are vague and unsatisfactory, as they refer merely to colour; but the dimensions can scarcely admit of a reasonable doubt on the subject. The locality mentioned by him as its most usual resort,—namely, on heaths,—is also, as far as it goes, a confirmatory fact.

It is to Mr. Jenyns, however, that we owe the only clear and satisfactory published description of this species as a native of Britain; and his account of its characters is as admirable for its correctness and perspicuity as any of the other descriptions of that accomplished author.

It is from the immediate vicinity of my own native place that the specimens which have hitherto formed the subjects of more recent observation have been obtained. I have been



familiar with it from my childhood; and its frequency in various parts of the sandy heaths around Poole and its neighbourhood gave me, when young, numerous opportunities of observing the remarkable difference of size between this and the other native species;—from which circumstance I had, even then, often suspected that they were distinct. Subsequently, when the prosecution of the study of Erpetology might perhaps have enabled me to distinguish them, the opportunity of observing them had ceased, until Mr. Jenyns, having, through Mr. Yarrell, obtained specimens from Poole, seized, with his usual acumen, upon the point of distinction, and speedily discovered the identity of this species with the *L. stirpium* of Daudin, of Milne Edwards, and of Dugés.

I shall be readily pardoned this long and somewhat dry investigation of the synonymy of this species by every systematic Zoologist who appreciates the importance of precision on this subject; and I now proceed to give a short history of its habits, as far as I have had an opportunity of observing them.

This beautiful species is found in the neighbourhood of Poole in somewhat different situations. Its general abode is on sandy heaths, where it is frequently seen crossing the small bye-paths with considerable swiftness, although it is certainly less rapid in its movements than the smaller and more common species. The transient glance which is thus obtained of it, “together with its viperine appearance and colours,” and the size and length of its body and tail, may easily have deceived Mr. Sheppard, who says that he has often mistaken it for the Viper when hastily passing it. But it is also occasionally seen on the sunny sides of green banks, basking in the sun’s rays, and retreating quickly upon the approach of any intruder. Mr. Sheppard mentions that he had “once or twice observed it near marshes;” and it is

occasionally seen in the small village of Hamworthy, near Poole, in moist situations. It has been stated by a gentleman of my acquaintance, that the brown varieties are confined to the sandy heaths, the colours of which are closely imitated by the surface of the body, and that the green variety, which I have already slightly alluded to, frequents the more verdant localities just mentioned. Be this as it may,—and it is a statement which at present I can neither confirm nor refute,—it is certain that these varieties, mentioned by Linneus and seen by Müller, do exist in the place I have named, and within a comparatively short distance.

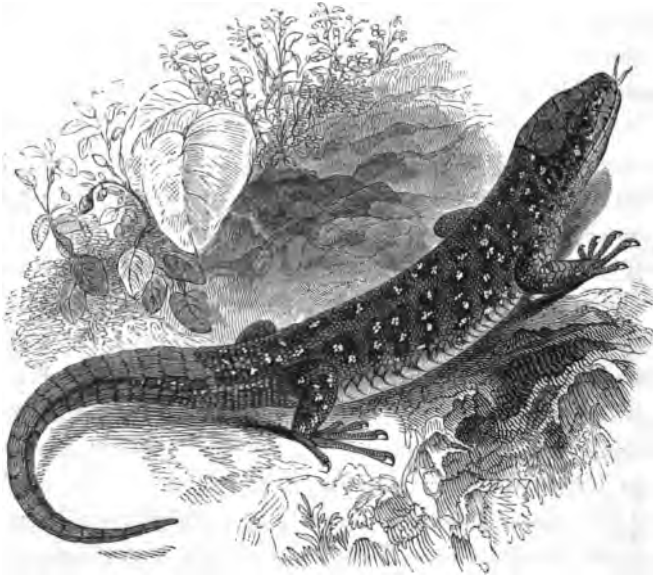
It is more timid and far less easily rendered familiar than the beautiful Green Lizard (*L. viridis*) of Guernsey and the South of Europe. This latter species may be readily tamed, and taught to come to the hand for its food, and to drink from the hollow of the palm of any one to whom it is accustomed. It will lie coiled up between the two hands, enjoying the warmth, and not offering to escape. But it is very different with the present species, which appears not to be susceptible of any such attachment. It will indeed attempt to bite any one who handles it, which I have never known to occur with the *L. viridis*. When in confinement, it ceases to feed, conceals itself with extreme timidity when approached, and ultimately pines and dies.

The female lays her eggs, to the number of twelve or fourteen, in hollows in the sand, which she excavates for the purpose, and having covered them carefully with sand, she leaves them to be hatched by the solar heat. It is probable that the eggs are laid a considerable time before they are hatched, as I have found the female containing numerous eggs of the full size, and apparently ready to be deposited, and yet without the vestige of an embryo within any of them: there is, therefore, every reason to conclude that this species

never brings forth her young alive, as is always the case with the common Lizard.

It is a northern species, rarely occurring so far south as Italy, but sufficiently common in the northern parts of France and the middle districts of the European Continent, and extending, as we have seen, as far north as Sweden and Denmark.

It varies exceedingly, like most others of the Lacertine group, in colour and marking. The most common colour of the upper parts is a sandy brown, with obscure longitudinal fasciæ of a darker brown, and a lateral series of black rounded spots, each marked with a yellowish white dot or line in the centre. There is often in this most common variety more or less of green on the sides. The following figure is of a very beautiful individual in my collection which was taken in the neighbourhood of Poole by my relative



Dr. Bell Salter: it is of a rich brown colour above, with a rather lighter fascia on each side near the mesial line, and a number of black ocellated spots, arranged almost continuously in somewhat irregular oblique fasciæ, each of these spots having a white pupil. There are in this, as in the one described by Mr. Sheppard, about four black spots on the head. This specimen has a remarkably short tail, and some other structural peculiarities, which led me at first to suppose that it belonged to a different species; but I am now satisfied that it is merely a variety of the present one. The comparative shortness of the tail probably arises from its having been mutilated and restored.

Another variety is that to which I have before alluded, in which the upper parts are more or less of a green hue. In some this colour is brighter and lighter than in others; but the usual colour is a rather dull brownish green. Not only is it very probable that the passages which I have quoted from Linneus and Müller indicate this variety, but I cannot help believing that all the accounts we have on record of the supposed occurrence of the Green Lizard, *L. viridis*, in Ireland and in England, are to be referred to individuals of the same variety of our present species, which were probably of unusually vivid hues, and observed under all the advantages of bright sunshine. Such may doubtless be the explanation of the "beautiful green *Lacerta*" seen by Gilbert White, "or the sunny sand-banks near Farnham."\* The Prince of Musignano, in his "Fauna Italica," figures a variety with the whole of the back of a dull brick-red colour. The under side is usually of a whitish or greyish colour, varied with light green towards the sides, about the collar, and

\* I find, by referring to my lamented friend Mr. Bennett's edition of the "Natural History of Selborne," that I have appended the following note to page 114:—"These were probably unusually large and bright individuals of the *L. stirpium*, now ascertained to be indigenous to this country."

under the tail, and a few black dots scattered about those parts.

In its general form this Lizard is much thicker and less gracile than the more common species. The head is rather more obtuse, the body more rounded, and the limbs stronger and shorter. The relative proportions of the tail and the body vary exceedingly in different individuals. As a general rule, it may be stated that the length of the head and body together is to that of the tail as three to four nearly; but in one specimen in my collection the proportions are nearly equal, and in that which is figured above, page 28, the tail is even considerably shorter than the head and body; but, as has been observed before, this may have occurred from the mutilation and reproduction of that part. The legs are so short, that when the posterior ones are brought forwards and the anterior placed backwards parallel to the side of the body, the hinder toes do not extend further than to the wrist of the anterior ones; in which respect it differs remarkably from the other species. In this, as in others, however, the abdomen of the female is proportionally larger than that of the male. The third and fourth toe of the fore foot are nearly of equal length; Mr. Jenyns says the former is the longer, but in some specimens the reverse is the case. The plates of the head\* are similar in their general form and proportions to those of most others of the genus. The nostrils are placed near the outer or inferior margin of the nasal plates, and nearly half-way between the anterior and posterior margins. The frontal plate is elongate pentagonal; the anterior angle obtuse; the lateral margins parallel, but slightly contracted about the middle; the inter-parietal pentagonal, and with a depressed point in the centre; the occipital very small. The upper eyelid with a series of very minute scales, and the whole surface of the lower covered by

\* See the figure in page 21.

similar ones; the space between the eye and the auditory passage covered with plates, of which the two superior, lying immediately under the parietal, are much the largest. The scales of the upper parts of the body are round or polygonal, and slightly, though distinctly, carinated. The abdominal plates in six rows, the middle series narrower than the adjoining ones. Præ-anal plate single, of a broad pentagonal form; the anterior margin bordered by four pairs of plates. Femoral pores varying in number from eight to fifteen on each side. In the specimen figured at page 28, there are eight on one side, and nine on the other. The pores are in this species placed in flat triangular scales; whilst in *Zootoca vivipara* the scales are so round and small as almost to form tubes. The tail is covered with numerous distinct whorls, according to Dugés from fifty to eighty, of elongated scales, which are longer, narrower, and more distinctly carinated towards the extremity. The number of whorls varies considerably in different individuals.

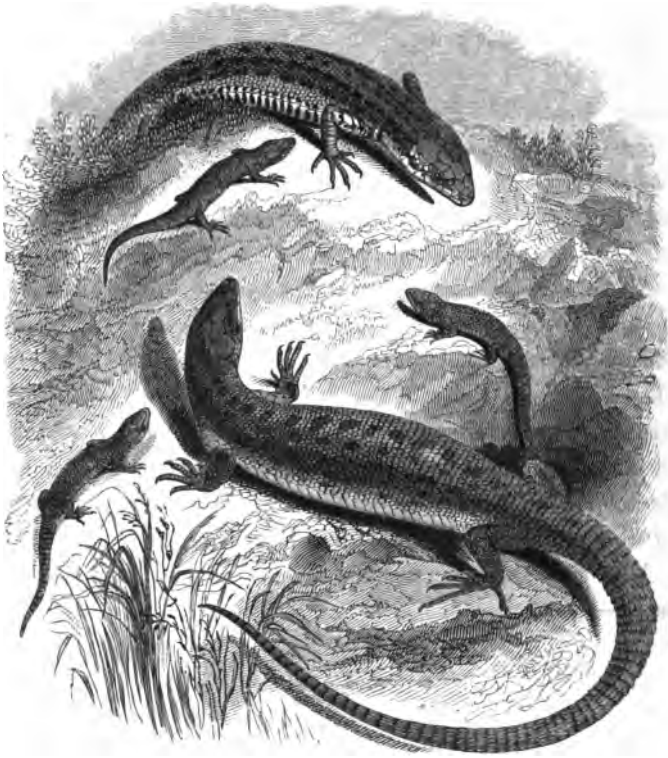
The following are the dimensions of one of moderate size :—

	In. Lines.
Total length . . . . .	7 2
Length of the head . . . . .	0 9
„ body . . . . .	2 5
„ tail . . . . .	4 0
Breadth of the head . . . . .	0 7



SAURIA.

LACERTIDÆ.



Genus, *Zootoca*. Wagl.

*Generic Character.*—Nostrils, collar, superorbital lamina, as in the genus *Lacerta*. Temples covered with adpressed scales. Scales of the back elongated and hexagonal. Palate toothless.

### VIVIPAROUS LIZARD.

NIMBLE LIZARD. COMMON LIZARD.

*Zootoca vivipara.*

*Lacertus terrestris vulgaris ventre nigro maculato*, MERRETT, Pinax, p. 169.  
RAY, Syn. Quad. p. 264.

*Lacerta agilis*, BERKENH. Syn. I. p. 56. SHEPPARD, in Linn. Trans. VII.  
p. 49. FLEM. Brit. An. p. 150. JENYNS, Brit. Vert.  
p. 292.

„ *vivipara*, JACQ. Nov. Act. Helv. I. p. 33, t. i.

*Zootoca* „ WAGL. Syst. Amph. p. 155.

*Scaly Lizard*, PENN. Brit. Zool. III. p. 21, t. ii.

MAS.

*Lacerta ædura*, SHEPPARD, l. c. p. 50.

ENOUGH has been said in the account of the former species on the subject of the nomenclature and synonymy both of that and of the present subject. I have there attempted to show that the Linnean name *agilis* has been hitherto improperly applied to this common species, and that it belongs to our other indigenous Lizard. It remains now only to say a few words on the identity of the present one with the *Lacerta vivipara* of the younger Jacquin. An examination of the figure in that author's paper will show that this synonymy is correct; and it is entirely confirmed by the fact of the ovo-viviparous character of our species. The following graphic and interesting account I copy from the paper referred to; and as the work is comparatively little known in this country, I make no apology for thus giving it in detail. It is an additionally interesting circumstance that this worthy son of so distinguished a father was only eleven years old when these observations were made.

“ In excursu botanico in Alpes vicinas, cum parente optimo, circa finem Julii præteriti instituto, obtulit sese mihi forte fortuna in monte Schneeberg, *Lacerta prægnans*, quam prehensam, ut servarem, capsulæ inclusi: præterlapso duorum dierum spatio cum hanc iterum aperirem, en! apparet illa onere, quod gestaverat, liberata, ac editis sex lacertis juvenculis stipata; ovorum in capsula reliquorum vestigia ne minima quidem hac licet sollicitè excussa, deprehendere licuit! quod eo magis mirabar, quo à CL. MULLERO, *System. Nat.*



t. iii. p. 77, traditam noveram, (quasi res esset in omnibus lacertarum generibus constanter observata) lacertas ova, eaque cute seu membrana vestita, magno numero excludere solere; cum autem neutiquam omnino vero sit simile, tam exiguo duorum dierum spatio, non ova tantum deponi, sed et ipsas ex his excludi potuisse lacertulas, non sine ratione concludere posse mihi videbar, hasce vivas à matre in lucem editas fuisse." Mr. Gray, in his Synopsis of Reptiles in Griffith's Animal Kingdom, refers Jacquin's *Lacerta vivipara* to the *L. muralis* of Daudin and Merrem (*Podarcis muralis* of Wagler): this mistake, however, Mr. Gray has, I believe, subsequently corrected.

It is in consonance with the remarks which I have ventured to make on the real value of generic characters, and the legitimate grounds for generic distinctions, that I have followed Wagler in assigning a distinct appellation to the present animal. Choosing minute and unimportant points of external structure as what may be termed its artificial character, it is in the peculiarity of its habits and physiology that I rest its claim for separation from the forms most nearly allied to it. But for this interesting peculiarity,—I mean the fact of its being ovo-viviparous,—I should certainly have retained it as a species of *Lacerta*, as I believe Mr. Gray has recently done. Although, therefore, I have adopted Wagler's division of the Lacertine group as far as regards our own indigenous species, I have done so upon very different grounds; and should not be disposed to follow him in many of the artificial divisions which he has made throughout the whole class of Reptilia.

This agile and pretty little creature is the common inhabitant of almost all our heaths and banks in most of the districts of England, and extending even into Scotland: it is also one of the few reptiles found in Ireland. On the Continent its range does not appear to be very extensive: it is

not found in Italy, nor, I believe, in France, and is very probably confined in a great measure to our own latitude. Its movements are beautifully gracile as well as rapid; it comes out of its hiding-place during the warm parts of the day from the early spring till autumn has far advanced, basking in the sun, and turning its head with a sudden motion the instant that an insect comes within its view, and darting like lightning upon its prey, it seizes it with its little sharp teeth and speedily swallows it. Thus it will often take a great number of the smaller insects, preferring those of the dipterous order; though it will not refuse many of the coleoptera or orthoptera, if they be not too large.

Instead of depositing her eggs in the sand to be hatched by the warmth of the sun, as is the case with the former, the female of the present species retains the eggs within the oviduct until the young are ready to leave them, and they are produced alive. As in all the ovo-viviparous reptiles, the covering of the egg is very thin, and merely membranous. In this respect they differ from those which deposit their eggs before the embryo is formed. In the latter case a more efficient protection is necessary, and the covering is either calcareous, as in the Tortoises and Crocodiles, or of a substance resembling parchment, as those of the Snakes and most Lizards. In the Viper, which also produces its young alive, the covering, as in the present animal, is extremely thin and very easily torn; and there is reason to believe that the laceration of this membrane and the emancipation of the young take place in and are occasioned by the very act of parturition.

As the young ones are occasionally found with the mother, there is some reason to believe that these little animals are not wholly devoid of the instinct of parental care and tendance; but it is scarcely probable that the exercise of this feeling is ever very powerful, or that it endures for any con-

siderable period. The young when brought forth are fully formed, and capable of running about, and very shortly afterwards of taking their own food. The usual number is from three to six.

Although I have alluded to the sun's influence as being the means of hastening the evolution of the embryo in the oviparous reptiles, it is not to be concluded that the same source of warmth is unnecessary in the present and similar instances. The only difference is, that in the ovo-viviparous species the solar heat is communicated to the embryo through the medium of the mother; and hence we often see the pregnant female about the month of June constantly basking in the sun, and lying in such a position as to expose the body most fully to his influence. Every one who has watched the habits of our native reptiles must have seen the same circumstance in the gravid female of the Common Viper; and may have observed how much more reluctantly and tardily she leaves the genial spot than the male.

This little Lizard is much smaller and more gracile in its form than the *L. agilis*. The head is more depressed, rather narrower, and the muzzle more acute. The arrangement and relative size of the plates on the head do not differ very considerably; but those of the temples are much smaller and more numerous in the present than in the former. The collar consists of nine plates, which are nearly equal; the abdominal plates in six rows, the middle and outer ones narrower than the intermediate. The dorsal scales are narrower, more angular, and the carina less distinct than in *L. agilis*: those of the tail are nearly similar. The feet are more slender, and the toes longer in proportion. The femoral pores, which vary less in number than in the other, being generally nine or ten, are placed in scales which are very different from the corresponding ones in *L. agilis*. Instead of being broad, flat and triangular, and much larger

than the orifice of the pores, as in that species, they are small, rounded, and so little larger than the pores, as to appear merely as the sides of a tube. This is a very tangible character, though, I believe, not before observed. "The following," says Mr. Jenyns, "are sexual distinctions: In the male, the tail and legs are longer in proportion to the body; the former is nearly (in some specimens quite) two-thirds of the entire length: the hind-leg applied to the side of the abdomen reaches to, or passes beyond, the carpus of the fore-foot; the ante-anal lamella is shorter, and broader, or more transverse; the under side of the base of the tail is flattened with a slight longitudinal depression of the middle just behind the vent; during the season of sexual excitement, the base of the tail is much dilated at the sides, appearing swollen.\* In the female, the abdomen is longer and the tail shorter, the latter being often not more than half the entire length: the hind-leg barely reaches to the tips of the claws of the fore-foot; the ante-anal lamella is longer in proportion to its breadth, and of a more decided hexagonal or pentagonal form; the base of the tail is rounded, and never dilated at the sides."†

The colours and markings of this species vary greatly. The general ground colour of the upper parts is a greenish brown, with a dark brown line down the middle of the back, which is often somewhat interrupted; a broad fascia extends parallel with this on each side, commencing behind the eyes, and extending to a greater or less length down the tail; between these and the former are often one or more rows of black dots, and similar ones occur in many individuals in the

\* It is in this state undoubtedly the *Lacerta ædura* described by Mr. Shepard in the seventh volume of the Linnean Transactions, as having the tail bulging out a little below the base, as if it had been cut off and set on again. This was first detected by Mr. Gray, and published in the Proceedings of the Zoological Society for 1834.

† Jenyns, Brit. Vert. p. 293.

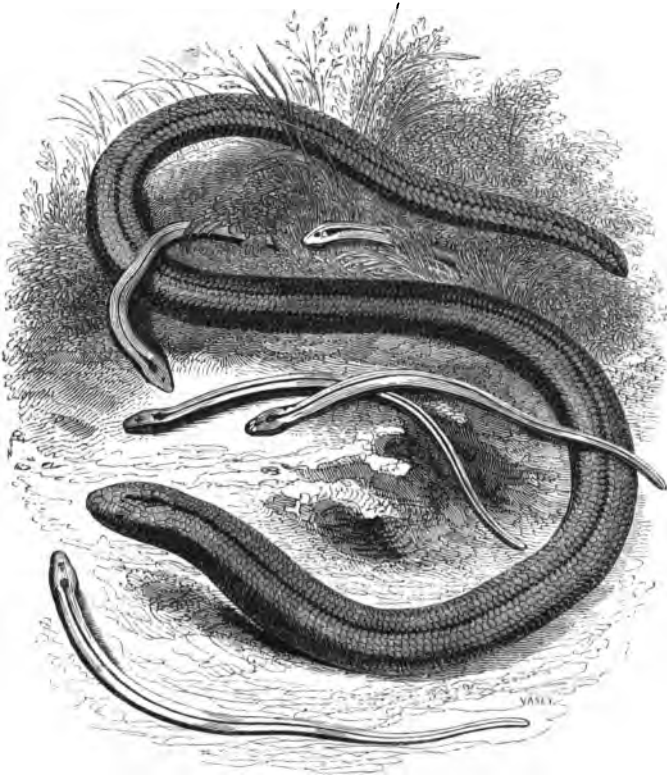
broad lateral fascia. The under side of the body and base of the tail in the male are bright orange, spotted with black : in the female these parts, as well as the tail, pale greyish green, without spots.

The usual length is from five inches and a half to six and a half : the head usually about five lines.



SQUAMATA.  
(SAUROPHIDIA.)

ANGUIDÆ.



Genus, *Anguis*. Linn.

*Generic Character*.—Body and tail cylindrical, obtuse; scales smooth, imbricate, nearly equal above and beneath; head covered with about nine larger plates; tympanum concealed; legs none; bones of the shoulder, the sternum, and pelvis rudimentary.

BLIND-WORM. SLOW-WORM.

*Anguis fragilis*. Linn.

*Specific Character*.—Silvery grey, a black longitudinal line extending down the back. Scales rounded and plain.

- Anguis fragilis*, LINN. Syst. Nat. I. p. 392. MULL. Zool. Dan. Prod. p. 36, sp. 306. LATR. Rept. IV. p. 209. DAUD. Rept. VII. p. 327, t. lxxxvii. f. 2. MERR. Syst. Amph. p. 79. WAGL. Syst. Amph. p. 159. GRAY, Syn. Rept. in Griff. An. Kingd. p. 74. FLEM. Brit. An. p. 155. JENYNS, Brit. Vert. p. 295. CH. L. BONAP. Faun. Ital. c. icon.
- Orvet commun*, CUV. Règ. An. 2 Edit. II. p. 70.
- Blind-worm*, PENN. Brit. Zool. III. p. 36, t. iv. No. 15.

THE group to which the genus *Anguis* belongs is one of the most interesting in its relations of all the forms of Reptilia. Under external characters considerably differing from each other,—some possessing the limbs and locomotion of true Lizards, and others wholly devoid of external members and moving like true Saurians,—there are in Mr. Gray's order *Saurophidia* many points of mutual affinity which prevent the possibility of separating them from each other. From the well-known family of the *Scinks*, or *Scincidæ*, with their true legs and five-toed feet, down to the present species and its immediate congeners, every possible gradation is to be found in the developement of the anterior and posterior extremities. Agreeing, as they all do, in the Saurian character of the structure of the head, the consolidation of the bones of the cranium and jaws, and the narrow and confined gape, so different from these parts in the true Serpents, they yet approach the latter in the comparative length of the bodies, and in the gradual diminution and ultimate disappearance of the extremities. In the genus *Scincus*, for instance, the limbs are already less robust than those of the true Saurians; the two pairs are also more distant from each other, in consequence of the greater comparative elongation of the body. There are as yet five perfect toes on each foot, which, however, are shorter and more even in their relative proportions than in the true Saurians. These deviations become in-

creased in the genus *Chalcides*, and still more in *Seps*, which has a very elongated body, the limbs extremely small, and the toes only four or three on each foot. In *Monodactylus* a further reduction takes place in the developement of the limbs, which have dwindled to a mere little undivided finger; they are still, however, four in number; but in the genus *Bipes* the anterior ones have wholly disappeared, and are found in a rudimentary state under the integument, the posterior ones constituting only small undivided processes. These also being removed, the Ophidian form of the present genus, and those of *Tortix*, *Typhlops*, and others, with all the *Amphisbænidae*, succeed, in which the bones of the shoulder, the sternum, and the pelvis exist in a more or less rudimentary condition; and lead us towards the true Snakes, in which all these parts are lost excepting the rudiment of a posterior extremity, which in the *Boa* appears externally in the form of a small horny hook, or holder, on each side of the vent. In the Serpents, the gape, too, has assumed its extreme power of extension, from the bones of the jaws and other parts of the face being separate; and in most of them the scales, which in the former groups were similar on the upper and under parts of the body and tail, are small and imbricated above, whilst beneath they assume the form of broad transverse plates. Such is a very brief account of the beautiful gradations by which these reptiles pass from the true or typical Saurian to the Ophidian form; and although, perhaps, it would be more consistent with analogy to consider, with Merrem, the whole of the scaled Reptilia as constituting one great order, yet the union of this interesting intermediate group, to which Mr. Gray has given the name *Saurophidia* from that relation, is a legitimate and important improvement upon the confusion in which they were left by Cuvier, who separated animals even of the same family, and placed some in his order "*Sauriens*," and others in his "*Ophidiens*."



The structure of the common Slow-worm, then, necessarily removes it from the Snakes, to which, indeed, it bears a less close affinity than to some of the Saurians. This structure, and the relations which it indicates, form an unanswerable argument of the fallacy of the position, that external characters are in all cases sufficient to indicate affinities; and show of how much importance, or rather how essential, is the anatomical investigation of internal structure, to enable us to arrive at the true relations of individual species or of groups.

The Blind-worm, or Slow-worm, by which names this species is known indifferently in this country, is found in almost every part of Europe, excepting the extreme north, and is capable of enduring a much colder climate than most other reptiles even of our own country. It is found in Russia, in Poland, in Denmark, Sweden, and Scotland, as well as throughout the whole of the more temperate parts of Europe, and as far south as the South of France, and Italy; but it has not, I believe, been seen in any part of Africa. It makes its appearance also at an earlier season than any other of our scaled reptiles. It retires in the autumn under masses of decayed wood or leaves, or into soft dry soil where it is covered with heath or brushwood, and penetrates to a considerable depth in such situations by means of its smooth rounded muzzle, and even polished body.

Its habits are extremely gentle and inoffensive. Even when handled roughly, it rarely attempts to bite; and when it is irritated so as to induce it to seize upon the finger, the teeth are so small as scarcely to make an impression. Of course the opinion that it is venomous is a mere vulgar error. There are no poison-fangs in the jaw, either of this or of any other species of the group to which it belongs. It is so timid, that on being laid hold of or pursued, it contracts itself so forcibly as to become perfectly stiff; and it is

then so fragile as to be easily broken in two either by a blow or an attempt to bend it. Hence it acquired the specific name of *fragilis*, applied to it by Linneus. This property, however, is not peculiar to the present species: the Glass-snake, as it is called, an American species, has derived its name from a similar circumstance. Like the Viper, and, in a less degree, also the Common Snake, this species is not easily induced to feed in a state of confinement. I have kept them repeatedly, and have offered them young frogs and insects, but without being able to induce them to take them. That this failure, however, was rather due to my ignorance of their favourite food than to any disinclination on their parts to feed in captivity, the following note by Mr. George Daniel in Mr. Bennett's edition of White's Selborne sufficiently testifies.

“ A Blind-worm that I kept alive for nine weeks, would, when touched, turn and bite, although not very sharply; its bite was not sufficient to draw blood, but it always retained its hold until released. It drank sparingly of milk, raising the head when drinking. It fed upon the little white slug (*Limax agrestis*, Linn.) so common in fields and gardens, eating six or seven of them, one after the other; but it did not eat every day. It invariably took them in one position. Elevating its head slowly above its victim, it would suddenly seize the slug by the middle, in the same way that a ferret or dog will generally take a rat by the loins; it would then hold it thus sometimes for more than a minute, when it would pass its prey through its jaws, and swallow the slug head foremost. It refused the larger slugs, and would not touch either young frogs or mice. Snakes kept in the same cage took both frogs and mice. The Blind-worm avoided the water; the Snakes, on the contrary, coiled themselves in the pan containing water which was put into the cage, and appeared to delight in it. The Blind-worm was a remark-

ably fine one, measuring fifteen inches in length. It cast its slough whilst in my keeping. The skin came off in separate pieces, the largest of which was two inches in length; splitting first on the belly, and the peeling from the head being completed the last."

These are interesting particulars; but it is certain that when in a state of liberty they do not exclusively live upon slugs, as I have found the remains of insects in the stomach; and they will also feed readily on earth-worms, even of six or seven inches long, according to the testimony of M. de Sept-Fontaines, as quoted by Lacépède.

The last-mentioned Erpetologist, who, however, like his colleague Buffon, was too credulous of all the stories told him, declares that this reptile would swallow mice, small rats, frogs, and toads. This is the statement of a person who has rather received for granted the assertions of the ignorant, than taken the trouble to observe for himself. The fact is, that the wholly undilateable character of the mouth necessarily restricts it to the deglutition of such prey as can be received within its narrow and circumscribed gape.

One very interesting point in its habits, is its being ovoviviparous. Like the last-described species, the *Zootoca vivipara*, the young of this animal are hatched before they come into the world; and it is probable that in this case, as in that of the species just named, as well as in the Viper and the Rattlesnake, the rupture of the membrane of the egg takes place during the parturition. The female is said to go with young about six weeks or two months: there can be no doubt, however, that the duration of this period must depend upon the temperature to which the animal is exposed. They are produced in June or July. The number of young ones produced at one birth varies from seven to twelve or thirteen. When brought forth, they are from eighteen to twenty-two lines in length. The young become very active

almost immediately after their birth, and soon learn to feed upon small soft insects, and probably small worms, snails, or slugs.

The shedding of its skin is performed by this species in the same manner as by most of the true Ophidians. It is, in fact, taken off in one piece, when the animal is at liberty and strong enough to effect this; and, like the others, it leaves the skin, turned inside out, attached to the brushwood, or other substance which it has employed to entangle or secure it as it was coming off. It is, however, stated that in some cases it is inverted only as far as the vent, and that the tail slips out of its covering "like a sword out of its scabbard."

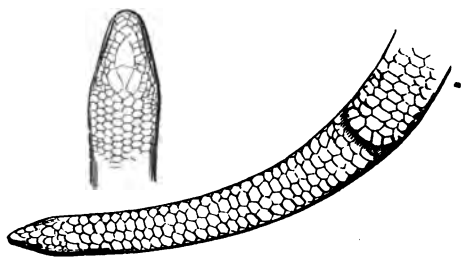
This animal is long, and almost of equal thickness throughout the whole length, but rather tapering posteriorly. The body is slightly tetragonal. The head is short and small; the eyes small, but very brilliant and quick; the eyelids perfect, as in the Lizards; the ears entirely covered with the integument; the teeth are very small, and slightly hooked; the tongue rather broad, not very extensile, notched at the extremity, but not bifid as in the true Snakes. Vertex covered with about nine plates; sides of the head, throat, back, sides, belly, and tail, all covered with small and nearly equal rounded scales, which are not carinated. The tail, which is obtuse, is, in some individuals, not more than half the length of the body, or even less; but in others, reaches to nearly an equal length with the head and body. My own observations would go to prove that this difference in the relative proportion of these parts may in some measure depend on sex; as we find in the Common Lizard that the body of the female is longer than that of the male.

The general colour is brownish grey with a silvery glance; and there are generally several parallel longitudinal rows of little dark spots along the sides, and, more constantly, one along the middle of the back. In some individuals the upper

part is wholly without spots or lines; the sides only being marked with an obscure band. The belly is of a bluish black colour, with whitish reticulations. The young ones are very light yellowish grey above; the sides and belly quite black; and there is a black dot on the vertex, and another on the occiput,—which latter gives origin to a slender longitudinal black line down the back.

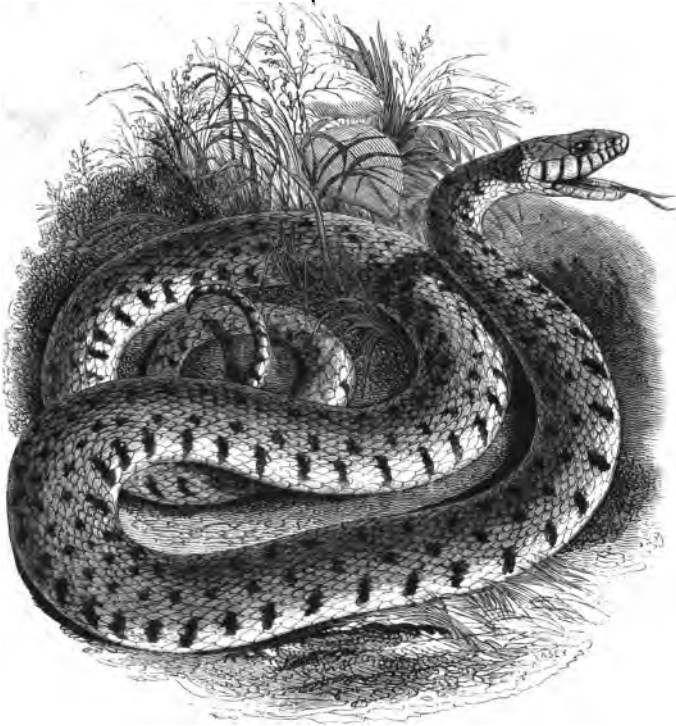
The total length is from ten to twelve, or even fourteen inches: the head half an inch, or a little more. The vignette gives a representation of the under part of the tail, and of the upper part of the head.

The *Anguis Eryx* of Linneus, the Aberdeen Snake of Pennant, communicated to them by Dr. David Skene, and said to have been taken in Aberdeenshire, was certainly nothing more than the common Slow-worm; and, from the description, can scarcely be considered even as a variety of it, so little does it differ, if indeed it can be said to differ at all, from its normal appearance.



SQUAMATA.  
(OPHIDIA.)

COLUBRIDÆ.



Genus, *Natrix*. . Laur.

*Generic Character*.—Head distinct, oblongo-ovate, depressed, covered with scuta ; gape wide ; body very long, nearly cylindrical, slightly depressed ; tail cylindrical, slender ; scales imbricated, placed in longitudinal series, lanceolate, generally carinated ; abdominal shields simple, arched at the margin ; caudal shields biserial.

RINGED SNAKE.

COMMON SNAKE.

*Natrix torquata*. Ray.

*Specific Character*.—Above greyish olive, with several rows of alternate black spots; beneath greenish yellow, tessellated with black (sometimes almost wholly black; an interrupted yellow fascia across the neck, followed by two black spots; scales lanceolate, acutely carinated; tail about one-fourth the length of the body.

- Natrix torquata*, RAY, Syn. Quad. p. 334. FLEM. Brit. An. p. 156.  
JENYNS, Brit. Vert. p. 296. BONAP. Faun. Ital. cum figuris.
- Coluber natrix*, LINN. Syst. Nat. I. p. 380. SHAW, Gen. Zool. III. p. 519. LATR. Hist. Rept. IV. p. 38. DAUD. Hist. Rept. VII. p. 34, t. lix. f. 15; t. lxxxii. f. 1. TURT. Brit. Faun. p. 81.
- „ *torquatus*, LACEP. Quad. Ovip. et Serp. II. p. 147, t. vi. f. 2.
- Natrix vulgaris*, LAUR. Spec. Med. p. 75 et 80.
- Tropidonotus natrix*, KÜHL.—FITZING. Prod. Faun. Aust. p. 326. WAGL. Syst. Amph. p. 179. GRAY, in Griff. An. Kingd. IX. p. 85.
- Ringed Snake*, PENN. Brit. Zool. III. p. 33, t. iv. No. 13.
- Couleuvre à Collier*, LACEP. l. c.

THE family of *Colubridæ*, to which our Common Snake belongs, is one of the most extensive of all the natural groups of reptiles. It includes a number of generic divisions, some more and some less strongly marked, which are found in every quarter of the globe. They are, all of them, perfectly free from any poisonous quality, not possessing any of those tubular teeth or poison glands which render some other families of Serpents so formidable. Many of the species which, on account of the broad plates which are found to occupy the upper part of the head, were considered as belonging to the genus *Coluber*, by Linneus and his immediate followers, are to be referred, not to other genera only, but to other families; as the Cobra di Capello, and the Common Viper, for instance.

To this family, then, belong those Serpents, and those only, which, in addition to the absence of poisonous fangs, have the head covered with broad plates, and the under side of the tail with divided scuta throughout its whole length, as shown in the following figures, which are taken from the present species.

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*See Wrapper, page 2 & 4*



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IN pursuance of the plan already commenced by the publication of the HISTORY OF BRITISH FISHES and of BRITISH QUADRUPEDES, it is intended that the latter work, now completed, shall be immediately succeeded by a HISTORY OF BRITISH REPTILES, by the same author; which, with the former works, and that of Mr. Yarrell on BRITISH BIRDS, will complete the Natural History of the Vertebrate Animals of the British Islands.

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